AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) ~~Device~~ A device for analyzing a thickness of tissue, ~~qualities of a tissue, such as tissue thickness, tissue surface roughness and/or degree of tissue fiber linearization,~~ said device comprising:

~~at least one~~ a light generating means; ~~(8,14, 15),~~

a probe ~~(1)~~ with an extension; ~~(3),~~

at least one fiber bundle ~~(7,17)~~ arranged in said extension ~~(3)~~, for conveying light from said light generating means ~~(8,14, 15)~~ to illuminate the surface of said tissue~~,~~;

~~and at least one~~ a light detecting means; and

~~(5,20) c h a r a c t e r i z e d in that~~ a signal processor configured to determine said thickness of said tissue based on data acquired by said light detecting means,

wherein said light generating means ~~(8, 14,15)~~ generates light of known intensity, of ~~at least one wavelength and including at least one polarization vector~~ a plurality of wavelengths;

~~that~~ said extension ~~(3)~~ is designed for conveying light back-scattered from said tissue to said light detecting means ~~(5,20),possibly including at least one fiber bundle (19)~~;

~~that~~ said light detecting means ~~(5,20)~~ is designed for measuring the intensity ~~and/or spatial distribution~~ of light back-scattered from said tissue for ~~at least one wavelength~~ said plurality of wavelengths, and~~; that said intensity and/or spatial distribution detected by said light detecting means (5,20) is analyzed to derive qualities of said tissue, such as tissue thickness, tissue surface roughness and/or degree of tissue fiber linearization.~~

said signal processor is arranged to analyze the measured intensities at said wavelengths to derive cartilage thickness, wherein the processor is arranged to determine the cartilage thickness based on a relative optical effect of cartilage and underlying bone.

2-3. (Cancelled)

4. (Currently Amended) ~~Device~~ The device according to claim 3 wherein said light generating means ~~(8,14)~~ includes means for generating light of at least two wavelengths including reference light and measurement light, where said reference light and measurement light are conveyed through said fiber bundle ~~(7)~~

in said extension ~~(3)~~ for illumination of said tissue surface, where said light detecting means ~~(5,20)~~ is designed to measure intensities of back-scattered parts of said reference light and measurement light, and where said signal processor ~~(13)~~ in said control apparatus ~~(6)~~ includes means for comparing said measured intensities of back-scattered reference light and measurement light in order to determine the thickness of said tissue.

5. (Currently Amended) ~~Device~~ The device according to claim 4 wherein said light detecting means ~~(5)~~ is a two-dimensional intensity detector.

6. (Currently Amended) ~~Device~~ The device in accordance with claim 4 where said light generating means ~~(8,14)~~ is a white light source for visualization of said tissue, and said reference light and measurement light are extracted from said white light source by a material selected to pass said reference light and measurement light.

7. (Currently Amended) ~~Device~~ The device in accordance with claim 4 comprising means for multiplexing said reference light and measurement light emitted from said light generating means ~~(8, 14)~~.

8. (Currently Amended) ~~Device~~ The device according to claim 3 where said light generating means ~~(8,14)~~ is a light source generating white light, where said white light is conveyed through said fiber bundle ~~(7)~~ in said extension ~~(3)~~ for illumination of said tissue, where said light detecting means ~~(5,20)~~ is designed to measure intensities of back-scattered parts of said white light for at least two wavelengths, and where said signal processor ~~(13)~~ in said control apparatus ~~(6)~~ includes means for comparing said measured intensities at the wavelengths of said reference light and measurement light in order to determine the thickness of said tissue.

9. (Currently Amended) ~~Device~~ The device according to claim 8 wherein said light detecting means ~~(5)~~ is a two-dimensional intensity detector.

10. (Currently Amended) ~~Device~~ The device in accordance with claim 1 wherein said light generating means ~~(8, 14)~~ includes means for generating light of at least two wavelengths including reference light and measurement light, where said reference light and measurement light are conveyed through said fiber bundle ~~(7)~~ in said extension ~~(3)~~ for illumination of said tissue, and where said extension ~~(3)~~ is designed for conveying light back-scattered from said tissue to an eye-piece ~~(18)~~ for visual inspection.

11. (Currently Amended) ~~Device~~ The device according to claim 10 where said light generating means ~~(8,14)~~ is a white light source for visualization of said tissue, and said reference light and measurement light are extracted from said white light source by a material selected to pass said reference light and measurement light.

12. (Currently Amended) ~~Device~~ The device in accordance with claim 10 comprising means for multiplexing said reference light and measurement light emitted from said light generating means ~~(8, 14)~~.

13. (Currently Amended) ~~Device~~ The device in accordance with claim 4 where the wavelength of said reference light is within a wavelength region where similar absorption between the components of said tissue is seen.

14. (Currently Amended) ~~Device~~ The device according to claim 13 where said tissue components are cartilage and bone and the wavelength of said reference light is within the 600-800 nm wavelength range.

15. (Currently Amended) ~~Device~~ The device accordance with claim 4 where the wavelength of said measurement light is

within a wavelength region where differences in absorption between the components of said tissue are seen.

16. (Currently Amended) ~~Device~~ The device according to claim 15 where the wavelength of said measurement light is within a wavelength region corresponding to a hemoglobin absorption peak, preferably in the vicinity of 425, 542 or 576 nm, or within a wavelength region with high water absorption, preferably the near- infrared region.

17. (Currently Amended) ~~Device according to claim 3 wherein said light generating means (15) includes means for generating polarized and non-polarized light, where said polarized and non-polarized light are conveyed through said fiber bundle (17) in said extension (3) for illumination of said tissue, where said light detecting means (5,20) is designed to measure intensities of back-scattered parts of said polarized and non-polarized light, and where said signal processor (13) in said control apparatus (6) includes means for comparing said measured intensities of back-scattered polarized and non- polarized light in order to determine the fiber linearization of said tissue.~~ A device for analyzing at least one of surface roughness of cartilage and degree of cartilage collagen fiber linearization, said device comprising:

at least of one light generating means;

a probe with an extension;

at least one fiber bundle arranged in said extension, for conveying light from said light generating means to illuminate the surface of said cartilage;

at least one light detecting means; and

a signal processor arranged to determine at least one of said surface roughness and degree of tissue fiber linearization based on data acquired by said light detecting means, wherein

said light generating means generates polarized and non- polarized light;

said extension is designed for conveying light back-scattered from said cartilage to said light detecting means,

said light detecting means is designed to measure intensities of back-scattered parts of said polarized and non-polarized light;

said signal processor is arranged to analyze said intensity detected by said light detecting means to derive at one of surface roughness of cartilage and degree of cartilage collagen fiber linearization, said analyzing comprises comparing

said measured intensities of back-scattered polarized and non-polarized light.

18. (Currently Amended) ~~Device~~ The device according to claim 17 wherein said light detecting means ~~(5)~~ is a two-dimensional intensity detector.

19. (Currently Amended) ~~Device~~ The device in accordance with claim 17 where said light generating means ~~(15)~~ is a light source generating white light for visualization of said tissue, and said polarized and non- polarized light are extracted from said white light by a material ~~(16)~~ selected to pass certain polarization states.

20. (Currently Amended) ~~Device~~ The device according to claim 19 where the direction of the polarization vector of said polarized light is determined by said material ~~(16)~~, as controlled by said control apparatus ~~(6)~~.

21. (Currently Amended) ~~Device~~ The device in accordance with claim 17 where said fiber bundle ~~(17)~~ conveying light from said light generating means ~~(15)~~ to said tissue is designed to maintain polarization state of said polarized light.

22. (Currently Amended) ~~Device~~ The device in accordance with claim 17 comprising means for multiplexing said polarized and non-polarized light emitted from said light generating means ~~(15)~~.

23. (Currently Amended) ~~Device~~ The device according to claim 19 where said material ~~(16)~~ is positioned at the distal end of said extension ~~(3)~~ of said probe ~~(1)~~.

24. (Currently Amended) ~~Device~~ The device in accordance with claim 1 wherein said light generating means ~~(15)~~ includes means for generating polarized and non-polarized light, where said polarized and non- polarized light are conveyed through said fiber bundle ~~(17)~~ in said extension ~~(3)~~ for illumination of said tissue, and where said extension ~~(3)~~ is designed for conveying light back-scattered from said tissue to an eye-piece ~~(18)~~ for visual inspection.

25. (Currently Amended) ~~Device~~ The device according to claim 24 where said light generating means ~~(15~~) is a light source generating white light for visualization of said tissue, and said polarized and non-polarized light are extracted from said white light by a material ~~(16)~~ selected to pass certain polarization states.

26. (Currently Amended) ~~Device~~ The device according to claim 25 where the direction of the polarization vector of said polarized light is determined by said material ~~(16)~~, as controlled by said control apparatus ~~(6)~~.

27. (Currently Amended) ~~Device~~ The device in accordance with claim 24 where said fiber bundle ~~(17)~~ conveying light from said light generating means ~~(15)~~ to said tissue is designed to maintain polarization state of said polarized light.

28. (Currently Amended) ~~Device~~ The device in accordance with claim 24 comprising means for multiplexing said polarized and non-polarized light emitted from said light generating means ~~(15)~~.

29. (Currently Amended) ~~Device~~ The device according to claim 25 where said material ~~(16)~~ is positioned at the distal end of said extension ~~(3)~~ of said probe ~~(1)~~.

30. (Cancelled)

31. (New) A method for analyzing tissue thickness, comprising:

measuring light intensity of a reference light back-scattered from cartilage covered bone;

measuring light intensity of a measurement light back-scattered from said cartilage covered bone; and

analyzing the ratio between measured intensities at said wavelengths to derive cartilage thickness, wherein said analyzing step comprises determining the cartilage thickness based on the relative optical effect of the cartilage and underlying bone.